

plants and animals. All this involves the preparation by the International Committee of an authoritative glossary of biological terms and the keeping of a systematic record of new terms. Like many other movements toward desired uniformity, its first result will probably be seen in the adoption by individual biologists of a conscious and systematic plan of terminology. It will not be very troublesome to unify future action; but the serious conflict will come when there is a demand to make to conform to new rules whatever of ancient terminology conflicts with them. However, American botanists should encourage this movement in every way, and it would be well to consider the subject at their next general meeting.

CURRENT LITERATURE.

The flora of Minnesota.

Minnesota has provided so liberally for its geological and natural history survey that the scientific men of other states might well feel envious. The first report¹ of the present state botanist has now been distributed and the size of the volume and excellent typography speak well for the wealth of material and opportunity for its creditable presentation. It is surprising how much can be said concerning a comparatively limited flora when one industriously studies it and begins to look at it from many points of view. Professor MacMillan has set a very high mark for state catalogues, and one that it is probably not necessary to reach in many cases. The introduction to the volume was previously distributed and noticed in this journal. In a preface the author agrees to follow the Rochester agreement and indicates the changes it would make in the nomenclature of the catalogue, the body of which was beyond his control at the time of the Rochester meeting. Although not in harmony with all the details of that agreement, the author frankly accepts them in the interest of uniformity, and if this spirit is universal American systematic botany has been emancipated from the fetish of names and can begin to study plants.

The list begins with the lower Metaspermæ and ends with the Compositæ. The Polypetalæ and Apetalæ are merged, as they ought to be under the name Archichlamydeæ. Naturally this merging is very

¹ MACMILLAN, CONWAY. — The Metaspermæ of the Minnesota Valley. A list of the higher seed-producing plants indigenous to the drainage-basin of the Minnesota River. Reports of the Geological and Natural History Survey of Minnesota, Botanical series, I. pp. XIII. 826, with two maps.

tentative as our knowledge of the phylogeny of these groups lies chiefly in the future, but it is just as well to express the little knowledge we have. The details of the list are carefully worked out as follows: name of family, with authors, synonyms and dates; number of genera and their general distribution; approximate number of species; name of genus, with author, place and date of publication; synonyms and dates; number and distribution of living species; number of extinct species if any have been recorded; name of species, with full synonymy, dates, etc.; North American and local distribution; representation in Minnesota collections. It will be seen that this gives a very large amount of information concerning the bibliography and range of each plant and will be of very great service to botanists. The list is summarised as follows: families, 106; genera, 407; species and varieties, 1174.

In our limited space it will be impossible to fully notice the general discussion of the metaspermic flora of the Minnesota Valley as contained in the last 200 pages. All the features of the valley which have to do with plant-life are first discussed, and this is followed by a very full consideration of the problems of geographical distribution in general and the local forces in particular which have had to do with the origin of the Minnesota flora. Numerous tables of statistics are given, and a full index closes the volume. Professor MacMillan is to be congratulated upon this very full and complete presentation of the subject he has had in hand. It must have involved an immense amount of careful and confining work, but we are confident that his labor has not been in vain.

Minor Notices.

THE SECONDARY EFFECTS OF POLLINATION have been presented in an able paper by W. M. Munson,¹ who has critically collated a very large number of published observations on the subject, chiefly from English and American sources. His own extended researches make his opinion especially valuable. Among the conclusions at which he arrives the following are especially prominent: Within certain restricted limits there is an immediate influence of pollen on the mother plant; the pea, kidney bean and Indian corn show unmistakable evidence of immediate effect of foreign pollen, while curcurbitaceous and solanaceous plants exhibit no immediate effect; the form and size of tomato plants are directly dependent upon the amount of pollen furnished; the egg-plant and English forcing cucumber are the best examples of organic development of fruit.

¹Annual Report of Maine Agricultural Experiment Station, 1892, part II. pp. 29-58. Illustrated. Issued under separate cover.

DR. WILLIAM TRELEASE, although fully occupied by the cares of the directorship of the Missouri Botanical Garden, finds time to publish periodically, and the periods are getting shorter, pieces of work that serve well to continue the reputation that Dr. Englemann brought to St. Louis. We have before us his further studies¹ upon that fascinating subject, the pollination of Yuccas. Dr. Trelease has had further opportunity of studying Yuccas in the field and has added a large amount of valuable information concerning this interesting group. Three species of *Pronuba* are now known to act as pollinators, and it is predicted that others will be found. After giving detailed notes of the various species, the author gives an interesting discussion as to the probable former range of *Yucca* and its adaptation to *Pronuba* pollination. It seems to be fairly well made out that the genus was formerly of much wider and more northern range, has been driven southward, and is now preserved in favoring localities. It also seems more than probable that ancestral forms had separate spreading stigmatic lobes which by their union have formed "the peculiar stigmatic chamber into which the pollen must be thrust in order to properly develop in tubes and fertilize the ovules." The separation of these stigmatic lobes has been observed both in *Hesperoyucca* and the true *Yucca*. It is naturally to be supposed that the evolution of *Pronuba* has gone "hand in hand with the adaptation of the Yuccas to their services in pollination," an evolution which Professor Riley has broadly sketched. A very interesting biological fact is, that a variety of *Y. Whipplei* (*Y. graminifolia* Wood) has as its pollinator a black variety (described here as new) of the Spotted *Pronuba* which pollinates the species. Another suggestive fact is that *Pronuba yuccasella* accompanies the true *Yucca* across the continent, and in California pollinates *Y. baccata*, and at the same time is associated with three other forms which are pollinators of Pacific types. Twenty-three excellent plates illustrate the paper, showing various species of *Yucca*, and *Pronuba* with dissections.

MR. CHARLES ROBERTSON, whose studies on the relation of flowers and insects are well known to the readers of the *BOTANICAL GAZETTE*, has just distributed the results of his studies among the *Labiatae*. The group is one of special interest in this connection, and after presenting details of observations Mr. Robertson discusses the family as to its flower forms, pointing out the least and most specialized ones and their probable origin. The unremitting attention which Mr. Robertson has given to this work has brought together a vast body of facts, which will presently represent all of our entomophilous groups.

¹ TRELEASE, WILLIAM.—Further studies of Yuccas and their pollination. From 4th annual report of Mo. Bot. Garden. pp. 181-226, plates 23.

² ROBERTSON, CHARLES.—Flowers and Insects—*Labiatae*. Trans. St. Louis Acad. Sci. VI. 101-131. Trans. St. Louis

MR. HENRY WILLEY has long been identified with the critical study of North American lichens, and since the death of Professor Tuckerman has been our lichenologist of largest experience. He has issued a pamphlet,¹ which he says terminates his thirty years' labor on the New Bedford lichens. Of the 369 species enumerated thirty-nine were new when first discovered, the present paper containing four not previously defined. The author expresses his regret "that the American professors of botany have so generally accepted the 'Schwendener theory,' as it is called, that lichens have no independent existence, but consist only of a fungus associated with an alga; and this, too, simply as a dogma, without having acquainted themselves with the arguments against it by the prominent lichenographers of Europe, and by Professor Tuckerman, in this country, and without having made any special studies of the plants themselves. These arguments constitute a considerable body of literature, of which none of these professors seem to have more than a little if any knowledge." A retort to this would be easy; but Mr. Willey can rest assured that whether lichens are to preserve their autonomy or are to be considered as wonderful examples of symbiosis they will always excite much interest and long be in need of critical study.

BOTANISTS who were present at the Washington meeting of the American Association, will remember Professor J. M. MacFarlane's public address upon plant hybrids. The full paper,² of which the address was simply a brief popular account, has now been distributed. The author has recorded fully his investigation of nine hybrids and their parents. He has, in every case, compared the three individuals as to external characters and internal structure, and has discovered that in every particular the hybrid has an intermediate character. The results he gives as to abundance and kinds of plant hairs, the distribution of stomata, the nature of the various tissues, even the structure of starch-grains and other cell-contents, show a remarkable intermingling of the characters of both parents. The bearing of these facts upon current biological problems is discussed, but from our point of view the facts presented tend more to substantiate such views as those of Weismann and his school than to discredit them.

PROFESSOR A. S. HITCHCOCK has just distributed the report of his

¹WILLEY, HENRY. — Enumeration of the Lichens found in New Bedford, Mass., and its vicinity, from 1862 to 1892. 8vo. 40 pp. Printed for the author, New Bedford, 1892. 50 cents.

²MACFARLANE, J. MUIRHEAD. — A comparison of the minute structure of plant hybrids with that of their parents, and its bearing on biological problems. Reprinted from Transactions of the Royal Society of Edinburgh xxxvii. pt. i. no. 14. pp. 203-286. pls. 8.
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expedition to the West Indies¹ during the winter of 1890-91. It consists of a list of the plants collected, together with a discussion of the Bahama flora, in which it seems evident that it is of southern origin. The few pages of the preface are chiefly devoted to discussing matters of nomenclature. In this the author was particularly fortunate in the delay of publication so that he is able to present a list which conforms to the Rochester agreement. Knowing something of the difficulties of collecting in the West Indies, and of determining the material when collected, the writer must congratulate Professor Hitchcock upon the length of the list and the very careful way in which it is presented. Every genus and species bears its date, a thing which will presently be as necessary as the author.

MR. W. W. ROWLEE has distributed a paper (with five plates), reprinted from January number of the *Bulletin* of the Torrey Botanical Club, on akenes and seedlings of Compositæ. He has studied various facts of structure and phenomena of germination. Very naturally, this detailed study of structure has shown that some of our generalizations have been too sweeping. His study of seedlings is compactly and clearly put, and is a valuable addition to the mass of similar facts being collected.

PROFESSOR ALBERT A. WRIGHT, of Oberlin, has issued a supplement to his list of the "Flowering and Fern Plants" of Lorain county, Ohio, (published in 1889). The list hereafter is to be referred to as Laboratory Bulletin no. 1. Over 100 new members have been added, making the total enumeration of species 931.

THE THIRTY-FIRST "Contribution from the herbarium of Columbia College"² deals with the genus *Polygonum*. Mr. Small recognizes seventy-nine American species and gives their range and synonymy. Two new Mexican species of *PERSICARIA* are described and some manuscript names and *nomina nuda* defined.

"THE OPENING of the buds of some woody plants" is the title of a recent paper³ by Professor Hitchcock. It is a series of notes taken during the spring of 1892. The field is a new and good one, and the study of twigs or winter-condition of shrubs and trees will presently have a literature of its own.

¹ HITCHCOCK, A. S.—Plants of the Bahamas, Jamaica and Grand Cayman. From 4th Annual Rep. of Mo. Bot. Garden. Issued March 9, 1893. Pp. 47-180, with 4 plates.

² SMALL, JOHN K.—A preliminary list of American species of *Polygonum*. Reprinted from Bull. Torr. Bot. Club XIX, 351-370.

³ HITCHCOCK, A. S.—The opening of the buds of some woody plants. Trans. St. Louis Acad. Sci. VI. 133-141. 4 plates.